Amendments to the Claims:

1. (Currently Amended) A method of tomographic imaging, and particularly a CT or MR method, for repetitively producing diagnostic slice images of a part of a patient's body, comprising:

a) making at least first and second current reference slice images of the part of the body, the first and second ~~slice~~ current reference slice images being in first and second reference slice image planes having first and second positions and first and second orientations that are differently oriented by a preset angular offset;

b) determining a geometrical transformation by which the first and second positions and orientations of the current reference slice images are brought into agreement with positions and orientations of at least first and second earlier reference slice images of the part of the body, the first and second earlier reference slice images being in first and second image planes having first and second positions and first and second orientations that are differently oriented by the preset angular offset,

c) calculating current imaging parameters by transforming earlier imaging parameters with the geometrical transformation,

d) ~~making of~~ controlling a tomographic scanner to make a series of current diagnostic slice images, positions and orientations in three dimensions of image planes of the series of current diagnostic slice images being determined by the calculated current imaging parameters, the position and orientation of the current diagnostic slice images being in agreement with positions and orientations in three dimensions of corresponding slice images of a series of prior ~~diagnosic~~ diagnostic slice images of the part of the patient's body.

2. (Previously Presented) The method as claimed in claim 1, wherein determining the geometrical transformation includes:

identifying reference points in the current reference slice images that agree with corresponding reference points in the earlier reference slice images.

3. (Previously Presented) The method as claimed in claim 1, wherein the geometrical transformation includes a rigid or an affine transformation that is defined by a set of transformation parameters, the set of transformation parameters being determined automatically by a suitable algorithm, optimizing a measure of similarity that represents the similarity of the current reference slice images to the corresponding earlier ones.

4. (Previously Presented) The method as claimed in claim 1, wherein the earlier reference slice images include at least two parallel slice images in each of head-foot, anterior-posterior and right-left directions.

5. (Currently Amended) A tangible computer-readable medium carrying a computer program which controls a computer to perform a method, which automatically determines imaging parameters by which a position and orientation in three dimensions of an image plane of a diagnostic slice image are determined, the method comprising:

a) receiving at least two current reference slice images which are perpendicular to each other and at least two earlier reference slice images which are perpendicular to each other,

b) determining a geometrical transformation by which the at least two current reference slice images are simultaneously brought into alignment with the at least two earlier reference slice images,

c) calculating current imaging parameters by transforming earlier imaging parameters by the geometrical transformation, and

d) controlling an imager using the current imaging parameters to generate a series of parallel current diagnostic images.

6. (Previously Presented) A tomographic imaging system comprising:

an image-making means for making diagnostic slice images;

a computer that operates the image-making means and calculates imaging parameters that determine particular positions and orientations in three dimensions of image planes of diagnostic slice images made by the image-making means, the computer being programmed to perform the steps of:

receiving at least two earlier reference slice images having a first position and non-parallel orientation relative to each other, the at least two earlier reference images being made using earlier imaging parameters;

controlling the image-making means to make at least two current reference slice images which have the first position and said non-parallel orientation relative to each other;

calculating a geometric transform that transforms the at least two current reference images into alignment with the at least two earlier reference images;

operating on the earlier imaging parameters with the calculated geometric transform to generate current imaging parameters;

controlling the image-making means to generate a plurality of parallel current diagnostic slice images using the current imaging parameters.

7. (Previously Presented) The computer-readable medium as claimed in claim 5, wherein determining the geometrical transform further includes:

with a computer algorithm, maximizing a similarity measure that represents a similarity between the current reference slice images and the earlier reference slice images.

8. (Previously Presented) The tomographic imaging system as claimed in claim 6, wherein

the at least two earlier reference slice images are oriented orthogonal to each other, and

the at least two current reference slice images are oriented orthogonal to each other.

9. (Currently Amended) The tomographic imaging system as claimed in claim 8, wherein a first of the earlier reference slice images and a first of the current reference slice images are transformed into alignment oriented along one ~~of the two~~ of foot-head, anterior-posterior, and left-right directions and a second of the earlier slice references and a second of the current reference slice images are transformed into alignment oriented along a different one of the foot-head, anterior-posterior, and left-right directions.

10. (Previously Presented) An imaging system for the production of diagnostic slice images of a patient, the system comprising:

an imaging unit which makes at least two current reference slice images of the patient, the current reference slice images being oriented along at least two of head-foot, anterior-posterior, and left-right directions;

a transform unit that determines a geometrical transformation which aligns the current reference slice images and at least two earlier reference slice images that are oriented along the at least two of the head-foot, anterior-posterior, and left-right directions;

a computer programmed to automatically calculate current imaging parameters by transforming earlier imaging parameters by the geometrical transformation and to operate the imaging unit using the current imaging parameters to set a position and orientation of an image plane in three dimensions and to generate a plurality of diagnostic slice images oriented in parallel image planes.

11. (Previously Presented) The system as claimed in claim 10, wherein the geometrical transformation is one of a rigid and an affine transformation defined by a set of transformation parameters, the set of transformation parameters being determined automatically by an algorithm which optimizes a measure that represents a similarity of the current reference slice images to corresponding earlier reference slice images.

12. (Previously Presented) The system as claimed in claim 10, wherein the earlier and current reference slice images each include at least two reference slice images oriented parallel to the parallel image planes and at least two reference slice images oriented perpendicular to the parallel image planes.

13. (Previously Presented) The system as claimed in claim 12, wherein the earlier reference slice images and the current reference slice images each include at least two reference slice images oriented in a head-foot direction, an anterior-posterior direction, and a right-left direction.

14. (Cancelled)

15. (Previously Presented) The method as claimed in claim 1, wherein the current reference slice images are orthogonal to each other and the earlier reference slice images are orthogonal to each other.

16. (New) The method as claimed in claim 1, wherein:

the first current and earlier reference slice images are brought into agreement in one of a head-foot direction, an anterior-posterior direction, and a left-right direction, and

the second current and earlier reference slice images are brought into agreement in a different one of the head-food direction, the anterior-posterior direction, and the left-right direction than the first current and earlier reference slice images, such that the present angular offset is 90°.

17. (New) The method as claimed in claim 15, wherein the first and earlier reference slice images are brought into alignment with the head-foot direction and the second current and earlier reference slice images are brought into alignment with the anterior-posterior direction and further including a third current reference slice image and a plurality of third earlier reference slices images and further including:

bringing the third current and earlier reference slice images into alignment with the head-foot direction.

18. (New) The method as claimed in claim 1, wherein a resolution of the first earlier and current reference slice images is different from a resolution of the second earlier and current reference slice images.

19. (New) The method as claimed in claim 1, further including a plurality of first earlier reference slice images and a plurality of second earlier slice images and further including:

aligning all of the first earlier and current reference slice images; and

aligning all of the second earlier and current reference slice images.